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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,488	04/11/2006	Anja Gerhard	37241005000	2090

21005 7590 04/15/2009

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EXAMINER	
WILLIAMS, AARON	

ART UNIT	PAPER NUMBER
2889	

MAIL DATE	DELIVERY MODE
04/15/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,488	GERHARD ET AL.	
	Examiner	Art Unit	
	Aaron Williams	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Receipt is acknowledged of applicant's amendment filed 1/12/2009. Claims 24-47 are pending and an action on the merits is as follows.

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

2. The disclosure is objected to because of the following informalities: The word substituent is misspelled.

Appropriate correction is required.

Claim Objections

3. Claim 24 is objected to because of the following informalities: The word substituent is misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 103

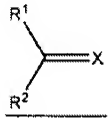
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 24-26, 29-33, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Grant Publication 2001/0051207 by Yamagata et al., herein refer to as Yamagata, in view of U.S. Patent 7,211,823 to Tung et al., herein refer to as Tung.

Regarding claim 24 Yamagata discloses in figure 2, An organic electroluminescent device, comprising: cathode (209, cathode, refer to paragraph [0008]) ; anode (202, anode, refer to paragraph [0008]); and at least two mutually delimited emission layers, said emission layers emitting different light wavelengths (206, 207, referred to as separate luminous layers refer to paragraph [0008]), wherein at least one emission layer further includes at least one phosphorescent emitter (refer to paragraph [0003] where it states the present invention incorporates the use of all known phosphorescence or fluorescence materials).

But Yamagata fails to teach and a matrix material represented by the following formula



wherein:

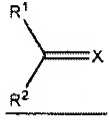
X is 0;

R^1, R^2 is the same or different at each instance and is an aromatic or heteroaromatic system having from 1 to 40 carbon atoms, in which one or more hydrogen atoms may be replaced by F, CI, Br, 1, and which may be substituted by one or more R radicals, and a plurality of substituents R^1 and/or R^1, R^2, either on the same ring or on the two different rings, may together in turn form a further mono- or polycyclic, aliphatic or aromatic ring system; with the proviso that R1 = R2 and is not hydrogen;

R is the same or different at each instance and is H, CN, a straight-chain, branched or cyclic alkyl, alkoxy or alkylamino group having from 1 to 40 carbon atoms, in which one or more nonadjacent CH-2 groups may be replaced by -R^4C=CR^4-,C =O, C=S, C=Se, C=NR^4, -0 -, -S-, -NR^5- or –CONR^6-, and in which one or more hydrogen atoms may be replaced by F, CI, Br. I;

R4, R5. R6 are the same or different at each instance and are H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms.

However Tung teaches and a matrix material represented by the following formula



wherein:

X is 0;

R^1, R^2 is the same or different at each instance and is an aromatic or heteroaromatic system having from 1 to 40 carbon atoms, in which one or more hydrogen atoms may be replaced by F, CI, Br, 1, and which may be substituted by one or more R radicals, and a plurality of substituents R^1 and/or R^1, R^2, either on the same ring or on the two different rings, may together in turn form a further mono- or polycyclic, aliphatic or aromatic ring system; with the proviso that R1 = R2 and is not hydrogen;

R is the same or different at each instance and is H, CN, a straight-chain, branched or cyclic alkyl, alkoxy or alkylamino group having from 1 to 40 carbon atoms, in which one or more nonadjacent CH-2 groups may be replaced by $-R^4C=CR^4-$,C =O, C=S, C=Se, $C=NR^4$, -0 -, -S-, $-NR^5-$ or $-CONR^6-$, and in which one or more hydrogen atoms may be replaced by F, CI, Br. I;

R4, R5. R6 are the same or different at each instance and are H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms (Figure 17, $Ir(F_2CNppy)_2$ is taught as one of several phosphorescent material the chemical structure of which as seen in figure 17 meets the limitation of claim, refer to lines 65-67 of column 4). Motivation to combine Yamagata OLED with Tung phosphor is to provide an efficient white phosphorescent OLED with high color stability lines 22-25 of column 4.

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to combine Yamagata OLED with Tung phosphor is to provide an efficient white phosphorescent OLED with high color stability.

Regarding claims 25 and 26, Yamagata further discloses the organic electroluminescent device as claimed in claim 24, further including additional layers such as a hole injection (203) and/or hole transport layers (204). Refer to Figure 2 and paragraph [0008] for further discussion.

Regarding claims 29 and 30, Yamagata further discloses the organic electroluminescent device as claimed in claim 24, wherein said device comprises three mutually delimited emission layers have the emission colors red, green and blue. Refer to Figure 2 and paragraph [0015] where there is a discussion of the three emission layers color spectrum.

Regarding claim 31 Yamagata further discloses the organic electroluminescent device as claimed in claim 24, wherein the emission layers comprise both layers in which emitters are present as pure materials and layers in which a plurality of compounds are present in a dopant matrix system, the weight ratio of matrix material to emitter being from 99:1 to 1:99. Refer to Figure 2 and paragraphs [0015] and [0022] where there is a discussion of the composition of the luminescence material and doping mixture.

Regarding claims 32 and 33 Yamagata further discloses the organic electroluminescent device as claimed in claim 24, wherein the phosphorescent emitter is a compound having at least one atom of atomic number greater than 38 and less than 84 and wherein the phosphorescent emitter comprises molybdenum, tungsten, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, silver, gold or europium.

Refer to paragraphs [0068] – [0076] where Yamagata incorporates the use of several variations of phosphorescence materials including platinum and iridium complexes.

Regarding claim 41 Yamagata further discloses, the organic electroluminescent device as claimed in claim 24, wherein the mutually delimited emitter layers have a thickness from 1 to 150 nm. Refer to paragraph [0015] where there is a discussion of the thickness of the three emission layers.

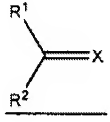
Regarding claim 46 Yamagata further discloses the organic electroluminescent device as claimed in one or more of claims 31, wherein the glass transition temperature T_g of the matrix materials of the emission layers is greater than 100° C. The glass transition temperature is an inherent property of the of the emitter layers. That since the materials are disclosed in the prior art, they will have the same glass transition temperature in an OLED.

6. Claims 24, 27, 28, 34, 35, 45, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,166,489 to Thompson et al., herein refer to as Thompson, in view of U.S. Patent 7,211,823 to Tung et al., herein refer to as Tung.

Regarding claim 24 Thompson discloses in figure 2 and 3, an organic electroluminescent device, comprising: cathode (105, cathode, referred to in column 4 lines 5 – 10) ; anode (101, anode, referred to in column 4 lines 5 – 10); and at least two mutually delimited emission layers, said emission layers emitting different light wavelengths (102, 104, referred to as separate OLED refer to column 3 lines 4 - 15),

wherein at least one emission layer further includes at least one phosphorescent emitter (refer to column 5 lines 5 – 15 where it states the present invention incorporates the use of all known phosphorescence or fluorescence materials by reference).

But Thompson fails to teach and a matrix material represented by the following formula



wherein:

X is 0;

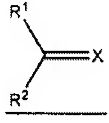
R^1, R^2 is the same or different at each instance and is an aromatic or heteroaromatic system having from 1 to 40 carbon atoms, in which one or more hydrogen atoms may be replaced by F, CI, Br, 1, and which may be substituted by one or more R radicals, and a plurality of substituents R^1 and/or R^1, R^2, either on the same ring or on the two different rings, may together in turn form a further mono- or polycyclic, aliphatic or aromatic ring system; with the proviso that R1 = R2 and is not hydrogen;

R is the same or different at each instance and is H, CN, a straight-chain, branched or cyclic alkyl, alkoxy or alkylamino group having from 1 to 40 carbon atoms, in which one or more nonadjacent CH-2 groups may be replaced by $-R^4C=CR^4-$,C =O,

C=S, C=Se, C=NR^4, -0 -, -S-, -NR^5- or –$CONR^6$-, and in which one or more hydrogen atoms may be replaced by F, CI, Br. I;

R4, R5. R6 are the same or different at each instance and are H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms.

However Tung teaches and a matrix material represented by the following formula



wherein:

X is 0;

R^1, R^2 is the same or different at each instance and is an aromatic or heteroaromatic system having from 1 to 40 carbon atoms, in which one or more hydrogen atoms may be replaced by F, CI, Br, 1, and which may be substituted by one or more R radicals, and a plurality of substituents R^1 and/or R^1, R^2, either on the same ring or on the two different rings, may together in turn form a further mono- or polycyclic, aliphatic or aromatic ring system; with the proviso that R1 = R2 and is not hydrogen;

R is the same or different at each instance and is H, CN, a straight-chain, branched or cyclic alkyl, alkoxy or alkylamino group having from 1 to 40 carbon atoms,

in which one or more nonadjacent CH-2 groups may be replaced by -$R^4C=CR^4$-,C =O, C=S, C=Se, C=NR^4, -0 -, -S-, -NR^5- or –$CONR^6$-, and in which one or more hydrogen atoms may be replaced by F, CI, Br. I;

R4, R5. R6 are the same or different at each instance and are H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms (Figure 17, $Ir(F_2CNppy)_2$ is taught as one of several phosphorescent material the chemical structure of which as seen in figure 17 meets the limitation of claim, refer to lines 65-67 of column 4). Motivation to combine Yamagata OLED with Tung phosphor is to provide an efficient white phosphorescent OLED with high color stability lines 22-25 of column 4.

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to combine Thompson OLED with Tung phosphor is to provide an efficient white phosphorescent OLED with high color stability.

Regarding claim 27 Thompson further discloses in at least figure 2 and 3, the organic electroluminescent device as claimed in claim 24, further including additional layers and electron injection and/or electron transport layers. Refer to column 3 lines 50 - 56 where it states:

"For simplicity, the light emitting layers 102 and 104 are shown as single layers in the drawings. As is well-known in the art, however, these layers actually comprise multiple sublayers (e.g., HTL's, EL's and ETL's) when they are not single-layer polymer devices. The arrangement of the sublayers obviously depends on whether the device is of DH or SH configuration."

"ETL" stands for electron transport layer.

Regarding claim 28 Thompson further discloses in at least figure 2 and 3, the organic electroluminescent device as claimed in claim 24, wherein the device exhibits emission of light in the range from 380 nm to 750 nm. Refer to column 3 lines 42 -44 where Thompson discloses an OLED capable of emitting any visible color of light, which ranges 380 nm to 750 nm.

Regarding 34 and 35 Thompson further discloses in at least figure 2 and 3, the organic electroluminescent device as claimed in claim 24, wherein at least one of the emission layers further comprises at least one nonphosphorescent emitter comprising at least one of the heterocycles. Refer to column 4 lines 41 - 43 were Thompson discloses the use of heterocycles emitter.

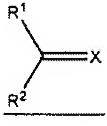
Regarding claim 45 Thompson further discloses in at least figure 2 and 3, the organic electroluminescent device as claimed in claim 24, wherein the glass transition temperature T_g of the at least two emitter layers is greater than 90° C. The glass transition temperature is an intrinsic property of the of the emitter layers. That since the materials are disclosed in the prior art, they will have the same glass transition temperature in an OLED.

Regarding claim 47 Thompson discloses in figure 2 and 3, the organic electroluminescent device as claimed in claims 24, wherein the glass transition temperature T_g of any layer is greater than 90° C. The glass transition temperature is an intrinsic property of the of the emitter layers. That since the materials are disclosed in the prior art, they will have the same glass transition temperature in an OLED.

7. Claims 24, 27, 36- 40, 42- 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Grant Publication 2006/0084347 to Tutt et al., herein refer to as Tutt, in view of U.S. Patent 7,211,823 to Tung et al., herein refer to as Tung.

Regarding claim 24, Tutt discloses in figures 1 - 5, an organic electroluminescent device, comprising: cathode (30, cathode, refer to paragraph [0116]) ; anode (20, anode, refer to paragraph [0028]); and at least two mutually delimited emission layers, said emission layers emitting different light wavelengths (24, 26, referred to as separate emissive layers refer to paragraph [0117]), wherein at least one emission layer further includes at least one phosphorescent emitter (refer to paragraph [0076] where it states the present invention incorporates the use known phosphorescence or fluorescence material as being useful in the emissive region).

But Tutt fails to teach and a matrix material represented by the following formula



wherein:

X is 0;

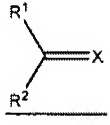
R^1, R^2 is the same or different at each instance and is an aromatic or heteroaromatic system having from 1 to 40 carbon atoms, in which one or more

hydrogen atoms may be replaced by F, CI, Br, 1, and which may be substituted by one or more R radicals, and a plurality of substituents R^1 and/or R^1, R^2, either on the same ring or on the two different rings, may together in turn form a further mono- or polycyclic, aliphatic or aromatic ring system; with the proviso that R1 = R2 and is not hydrogen;

R is the same or different at each instance and is H, CN, a straight-chain, branched or cyclic alkyl, alkoxy or alkylamino group having from 1 to 40 carbon atoms, in which one or more nonadjacent CH-2 groups may be replaced by $-R^4C=CR^4-$,C =O, C=S, C=Se, $C=NR^4$, -0 -, -S-, $-NR^5-$ or $-CONR^6-$, and in which one or more hydrogen atoms may be replaced by F, CI, Br. I;

R4, R5. R6 are the same or different at each instance and are H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms.

However Tung teaches and a matrix material represented by the following formula



wherein:

X is 0;

R^1, R^2 is the same or different at each instance and is an aromatic or heteroaromatic system having from 1 to 40 carbon atoms, in which one or more hydrogen atoms may be replaced by F, CI, Br, 1, and which may be substituted by one or more R radicals, and a plurality of substituents R^1 and/or R^1, R^2, either on the same ring or on the two different rings, may together in turn form a further mono- or polycyclic, aliphatic or aromatic ring system; with the proviso that R1 = R2 and is not hydrogen;

R is the same or different at each instance and is H, CN, a straight-chain, branched or cyclic alkyl, alkoxy or alkylamino group having from 1 to 40 carbon atoms, in which one or more nonadjacent CH-2 groups may be replaced by $-R^4C=CR^4-$,C =O, C=S, C=Se, $C=NR^4$, -0 -, -S-, $-NR^5-$ or $-CONR^6-$, and in which one or more hydrogen atoms may be replaced by F, CI, Br. I;

R4, R5. R6 are the same or different at each instance and are H or an aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms (Figure 17, $Ir(F_2CNppy)_2$ is taught as one of several phosphorescent material the chemical structure of which as seen in figure 17 meets the limitation of claim, refer to lines 65-67 of column 4). Motivation to combine Tutt OLED with Tung phosphor is to provide an efficient white phosphorescent OLED with high color stability lines 22-25 of column 4.

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to combine Tutt OLED with Tung phosphor is to provide an efficient white phosphorescent OLED with high color stability.

Regarding claim 27 Tutt further discloses in at least figures 1 - 5, further including additional layers and electron injection and/or electron transport layer. This limitation is

met by items 12 in figure 1b, and 36 in figure 5, referred to as hole blocking layers, in paragraph [0117] Tutt discloses that hole blocking layers facilitate electron flow i.e. electron transport.

Regarding claim 36 and 37 Tutt further discloses in at least figures 1-5, further including at least one hole blocking layer (HBL), wherein the HBL comprises at least one hole blocking material (HBM) selected from the azaphenanthrenes, metal chelate complexes, metal complexes or spirophenylenes, disposed between the at least two emission layers. Refer to paragraphs [0109] and [0117] where the HBL composition is described as being made of "metal… chelated oxinoid compound." The HBL are located in between the red and blue emissive layers.

Regarding claim 38 Tutt further discloses in at least figures 1 – 5, further including at least one electron blocking layer (EBL) disposed between the at least two emission layers. Refer to paragraph [0029] where a description of item 12, a hole transporting layer which is inherently a electron blocking layer. Then an electron blocking is deposited between a red emissive layer and a blue emissive layer in example 5, described in paragraphs [0153] – [0163].

Regarding claim 39 Tutt further discloses in at least figures 1 – 5, wherein the EBL comprises at least one electron blocking materials (EBM) selected from the triarylamines, spirotriarylamines or the phthalocyanines. Refer to paragraph [0029] where a description of item` 12, a hole transporting layer which is intrinsically an electron blocking layer.

Regarding claim 40 Tutt further discloses in at least figure 5, further including at least one electron blocking layer (EBL) (38) and at least one hole blocking layer (HBL) (36) disposed between the at least two emission layers. Refer to paragraph [0138] for further details.

Regarding claim 42 Tutt further discloses in at least figure 5, wherein the electron transport layer has a thickness from 1 to 150 nm. Refer to paragraph [0146] for a description of a 30 nm thick electron transport layer.

Regarding claim 43 Tutt further discloses in at least figure 5, wherein the hole blocking layer has a thickness of from 1 to 150 nm. Refer to paragraph [0169] for a description of a 30 nm thick hole blocking layer.

Regarding claim 44 Tutt further discloses in at least figure 5, further including at least one electron transport layer and at least one hole blocking layer, disposed between the at least two emission layers, wherein said at least one electron transport layer, at least one hole blocking layer and said emitter layers each have a different thickness in the range from 1 to 150 nm. Refer to paragraph [0138] for further details about the electron transport layer and the hole blocking being between emissive layers. Refer to paragraph [0169] for a description of a 30 nm thick hole blocking layer. Refer to paragraph [0146] for a description of a 30 nm thick electron transport layer. Refer to paragraph [0158] for a description of a 30.6 nm thick red emissive layer. Refer to paragraph [0161] for a description of a 25.3 nm thick red emissive layer.

Response to Arguments

8. Applicant's arguments with respect to claim 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Williams whose telephone number is (571) 270-5279. The examiner can normally be reached on Monday thru Friday 7:00 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron Williams/
Examiner, Art Unit 2889

/Karabi Guharay/
Primary Examiner, Art Unit 2889